USB
FLASH-MEMORY
CONTROLLER

10

LED-OUT

ACT

VDD

CLK   N-BIT ADDRESS
GENERATOR/CNTR   RS

12

A1 A2 A3 • • • AN

OE   M-BIT ADDRESS
DECODER   14

D1   D2   D3   DM

LED
DISPLAY   20   21   22   23

VDD

30   31   32   33

FIG. 1

ACT

/OE

RESET

AN:A0   0000   0001   0010   0011   0100   0101

D0

D1

D2

D3

FIG. 2

OE

M-BIT ADDRESS
DECODER   14

VDD

D1   D2   D3   DM

LED
DISPLAY

20   21   22   23   38

FIG. 3

OE

M-BIT ADDRESS
DECODER   14

D1R   D1G   D1B   DMR   DMG   DMB

MULTI-COLOR
LED
DISPLAY

40   41   42   44   45   46   VDD

48   49

FIG. 4

USB
FLASH-MEMORY
CONTROLLER

10'

LED-OUT   GPB1:N

ACT

52

GPB1:N

VDD

PATTERN
DECODING
CONTROLLER
(PDC)

RS

CLK

50

D1   D2   D3   DM

LED
DISPLAY

20   21   22   23

VDD

30   31   32   33

FIG. 5

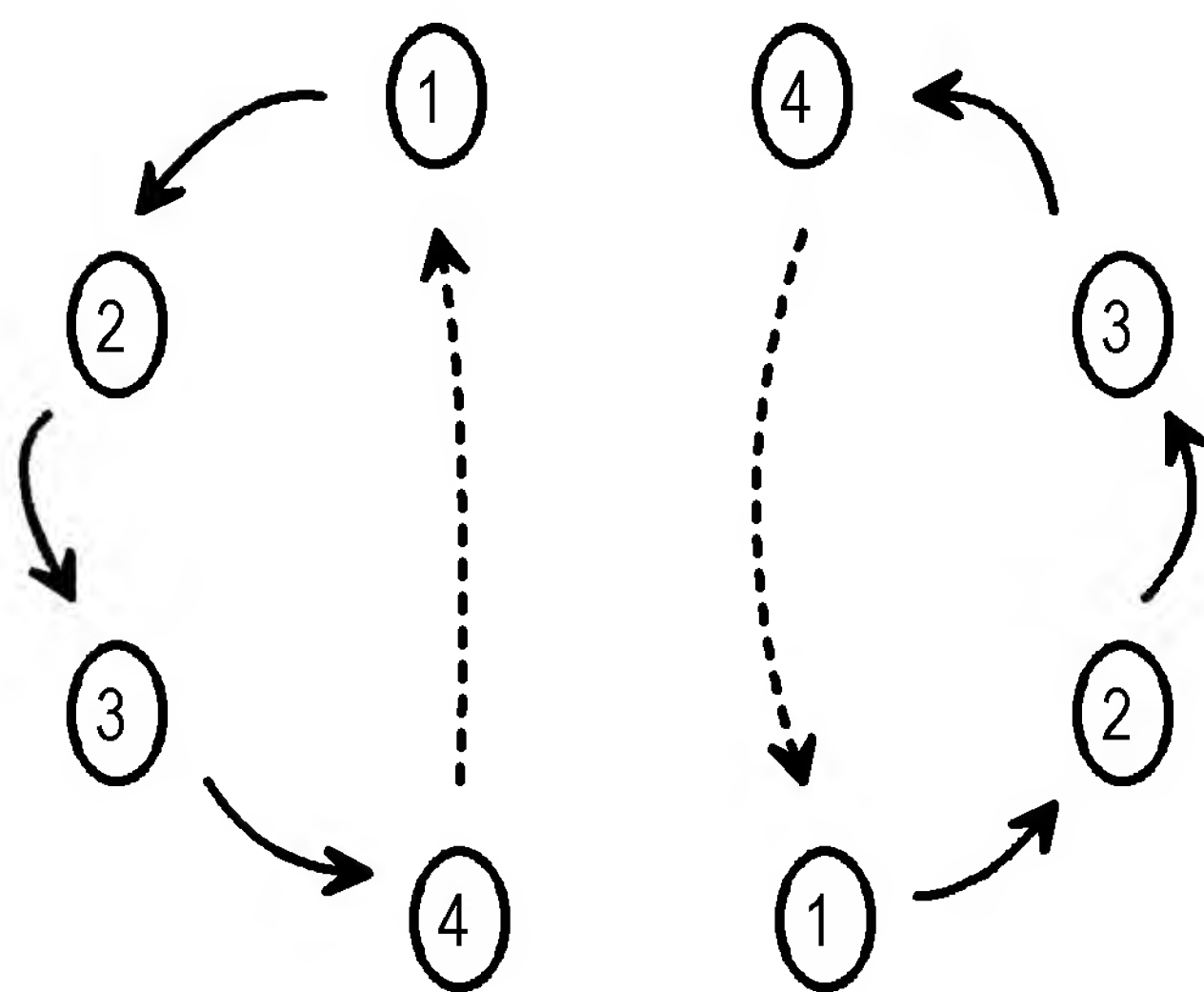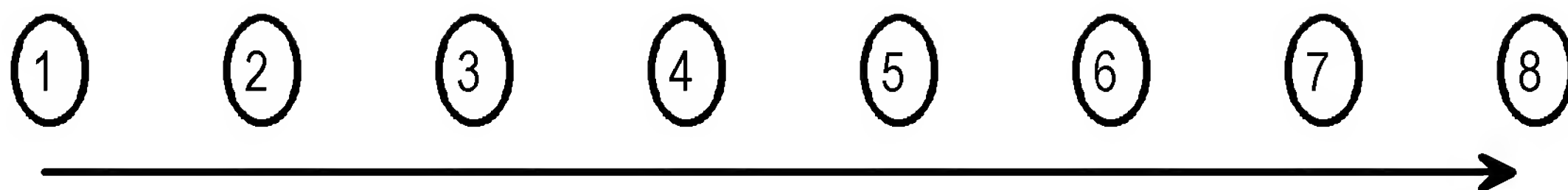| GPB (7:0)	Function	Figure
0000 0000	Line Continue (Forward)	FIG. 9A
0000 0001	Line Continue (Backward)	FIG. 9B
0000 0010	Line Jump 1 (Forward)	FIG. 9C
0000 0011	Line Jump 1 (Backward)	FIG. 9D
0000 0100	Line Jump 2 (Forward)	FIG. 9E
0000 0101	Line Jump 2 (Backward)	FIG. 9F
0000 0110	Line Jump 3 (Forward)	
0000 0111	Line Jump 3 (Backward)	
0000 1000	Line Jump 4 (Forward)	
0000 1001	Line Jump 4 (Backward)	
0000 1010	Line Jump 5 (Forward)	
0000 1011	Line Jump 5 (Backward)	
0000 1100 – 0000 1111	Reserved for Future	
0001 0000	Line 2 Continue (Forward)	FIG. 10A
0001 0001	Line 2 Continue (Backward)	FIG. 10B
0001 0010	Line Inward	FIG. 10C
0001 0011	Line Outward	FIG. 10D
0001 0100	Line 2 Jump 1 (Forward)	FIG. 10E
0001 0101	Line 2 Jump 1 (Backward)	FIG. 10F
0001 0110 – 0001 1111	Reserved for Future	
0010 0000	2 Clockwise Circles	FIG. 11A
0010 0001	2 Counter Clockwise Circles	FIG. 11B
0010 0010	2 Line Inward	FIG. 11C
0010 0011	2 Line Outward	FIG. 11D
0010 0100 – 0010 1111	Reserved for Future	
0011 0000 – 0011 1111	Reserved for Round Circles Sequencings	
0100 0000 – 0100 1111	Reserved for Tri-angles Sequencings	
0101 0000 – 0101 1111	Reserved for Square Sequencing	
0110 0000 – 1111 1111	Reserved	

FIG. 6
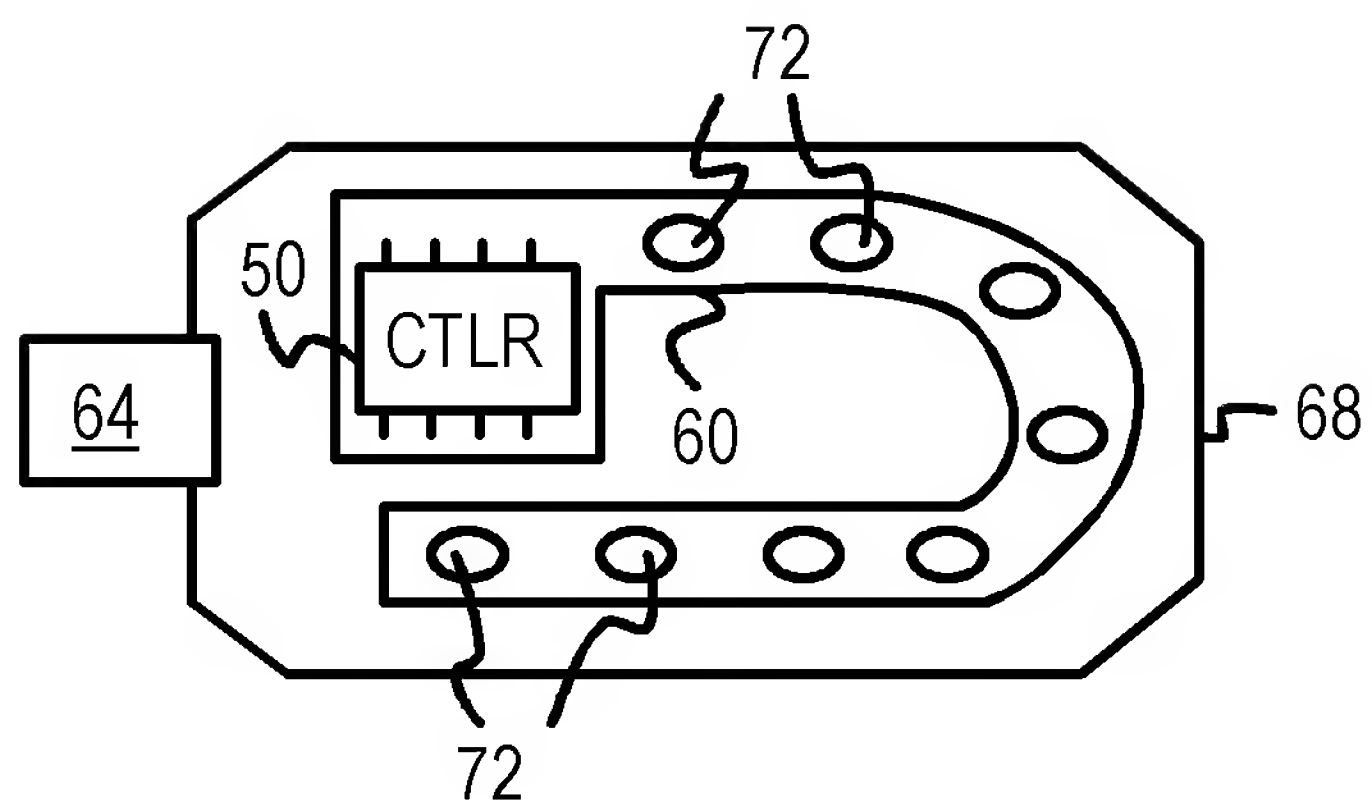
FIG. 7

FIG. 8

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

FIG. 9A   CONTINUE FORWARD

⑧ ⑦ ⑥ ⑤ ④ ③ ② ①
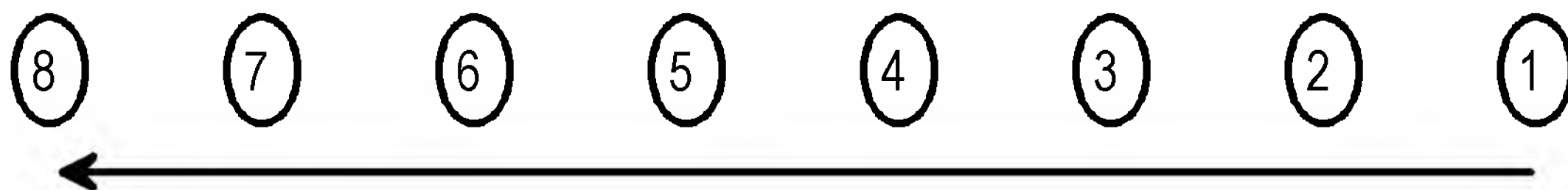
FIG. 9B   CONTINUE BACKWARD

① ⑤ ② ⑥ ③ ⑦ ④ ⑧
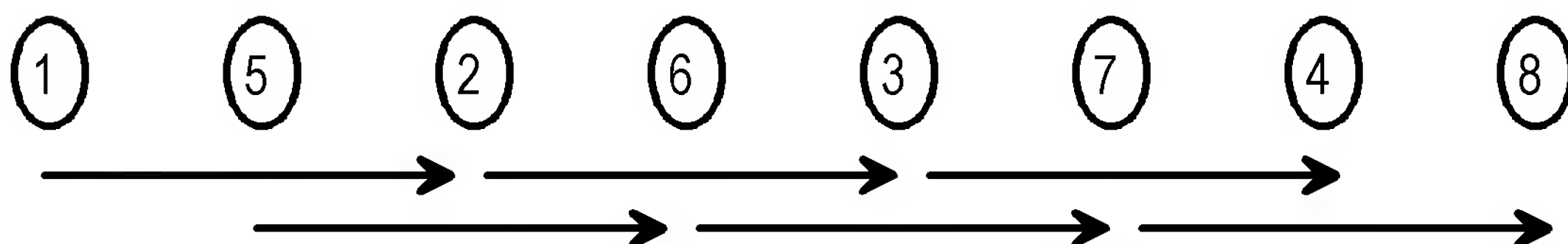
FIG. 9C   JUMP-1 FORWARD

⑧ ④ ⑦ ③ ⑥ ② ⑤ ①
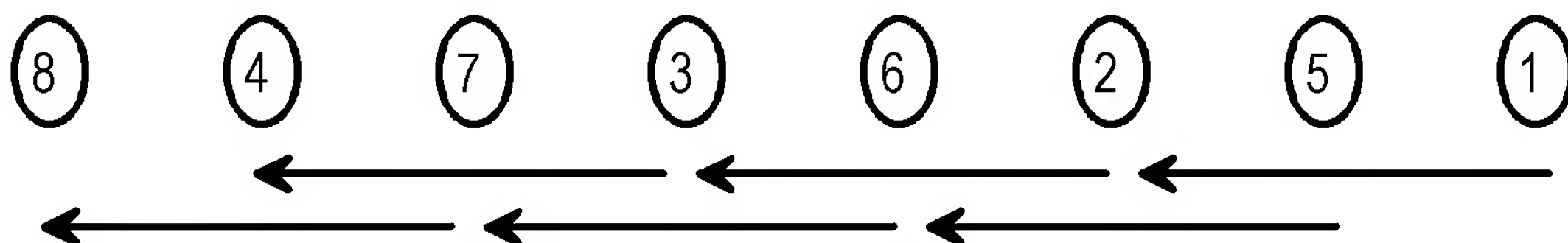
FIG. 9D   JUMP-1 BACKWARD

① ④ ⑦ ② ⑤ ⑧ ③ ⑥
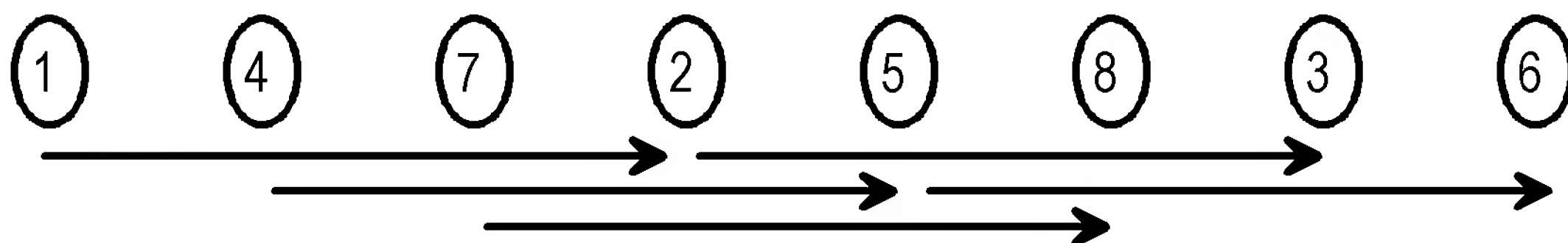
FIG. 9E   JUMP-2 FORWARD

⑥ ③ ⑧ ⑤ ② ⑦ ④ ①
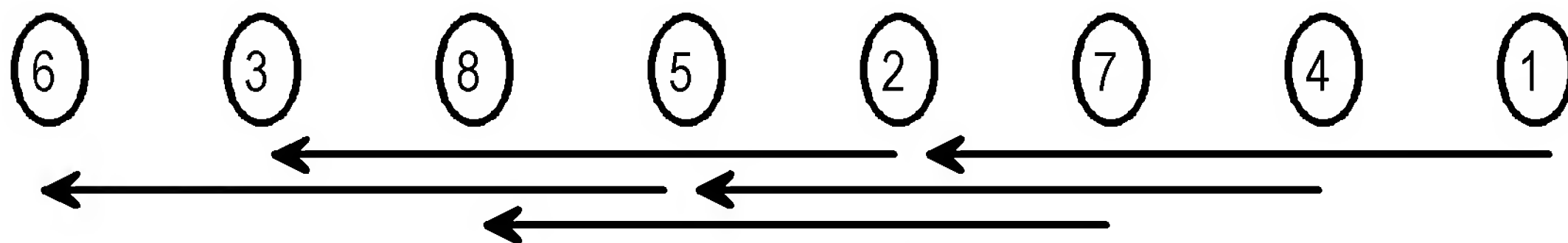
FIG. 9F   JUMP-2 BACKWARD

① ② ③ ④   ① ② ③ ④

→ → →   → → →
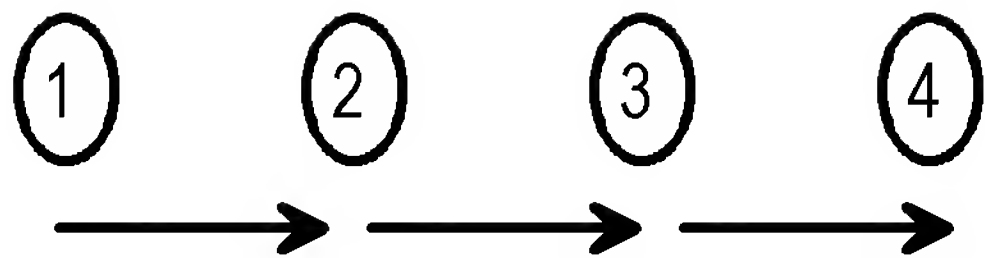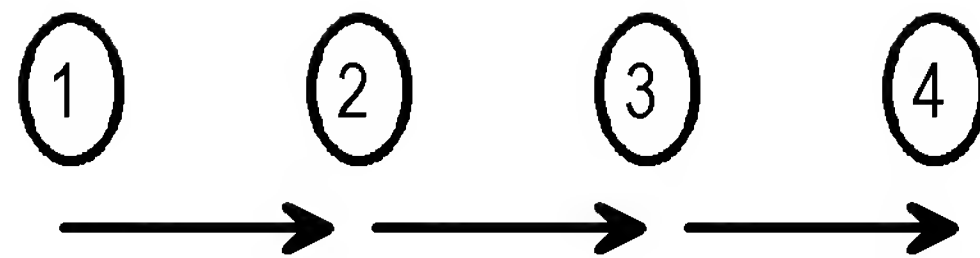
FIG. 10A   2X CONTINUE FORWARD

④ ③ ② ①   ④ ③ ② ①

← ← ←   ← ← ←
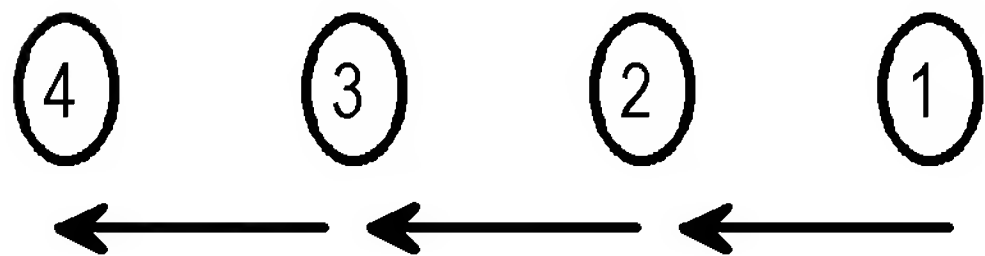
FIG. 10B   2X CONTINUE BACKWARD

① ② ③ ④   ④ ③ ② ①

→ → →   ← ← ←

FIG. 10C   INWARD

④ ③ ② ①   ① ② ③ ④

← ← ←   → → →

FIG. 10D   OUTWARD

① ③ ② ④   ① ③ ② ④

→ →   → →
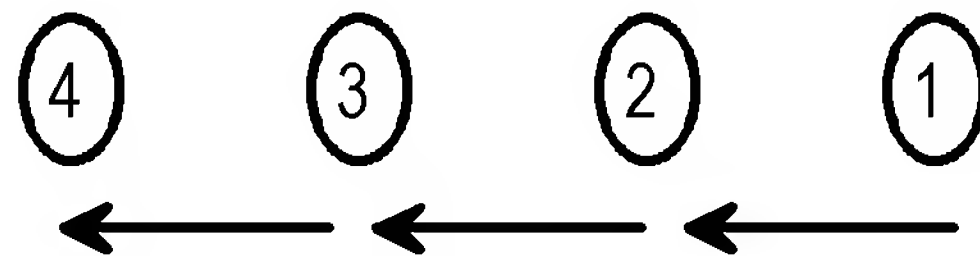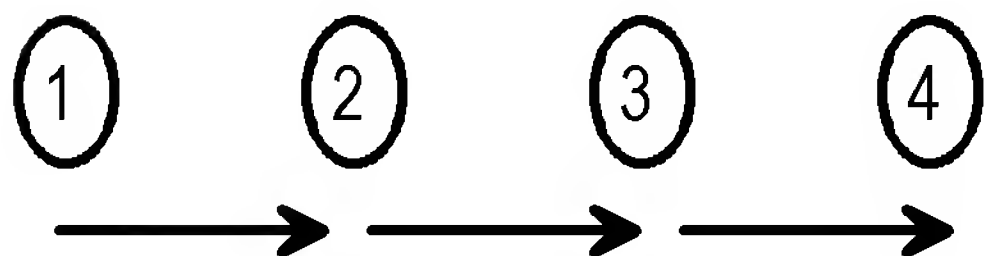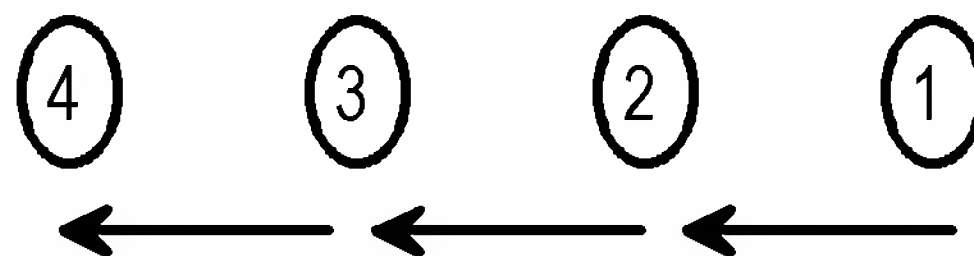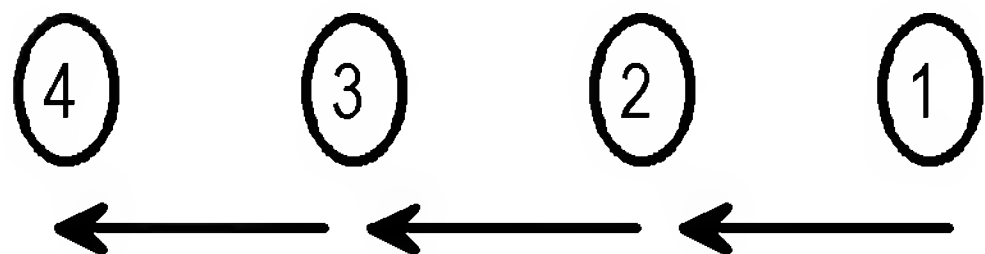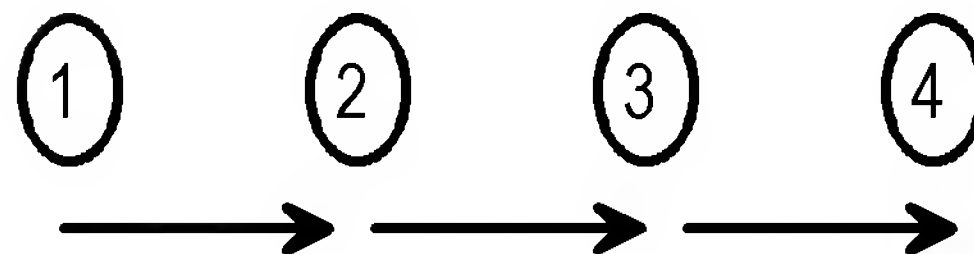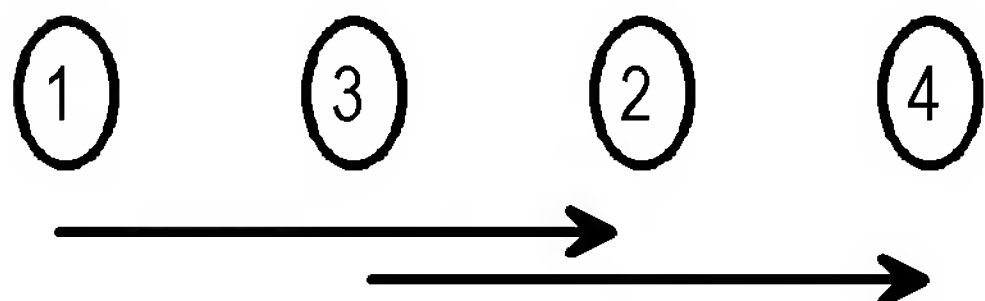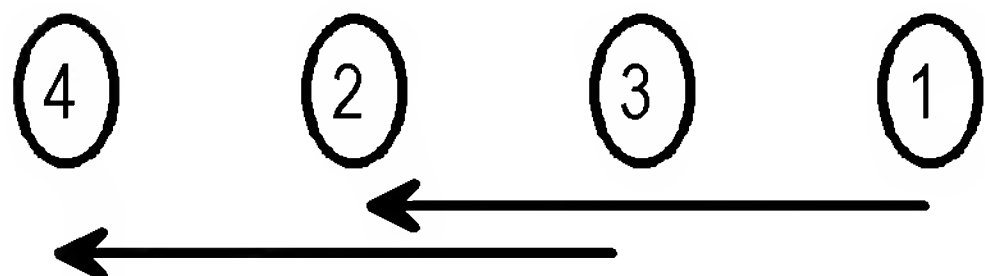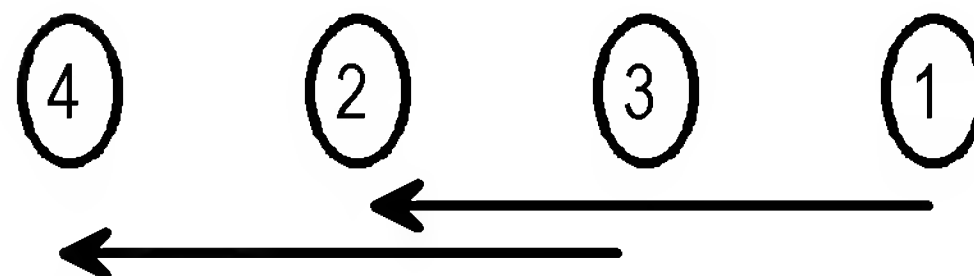
FIG. 10E   2X JUMP-1 FORWARD

④ ② ③ ①   ④ ② ③ ①

← ←   ← ←
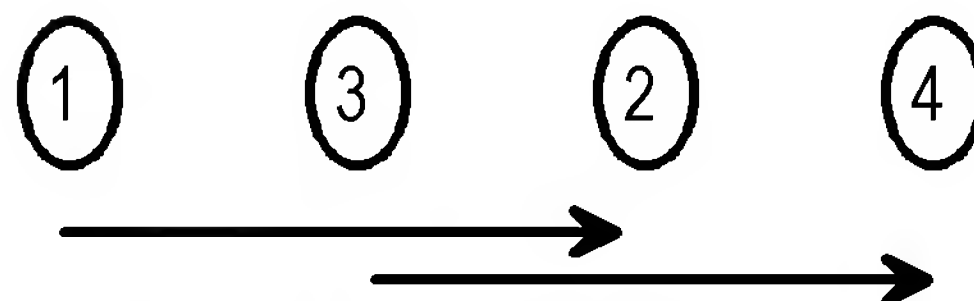
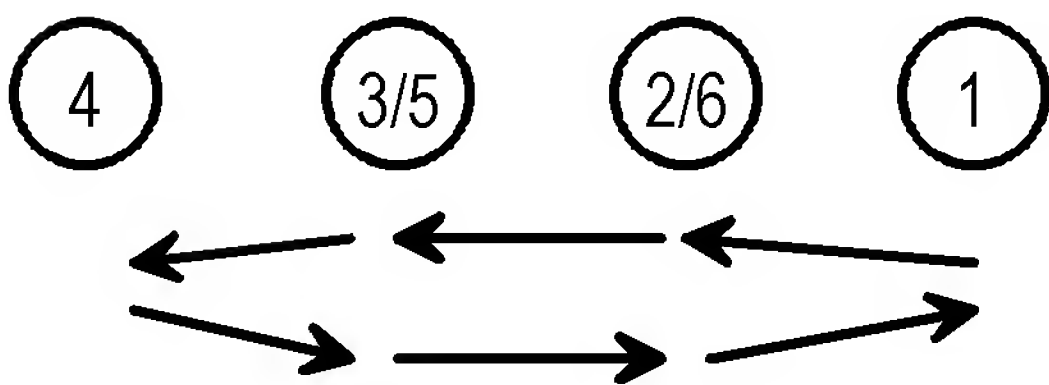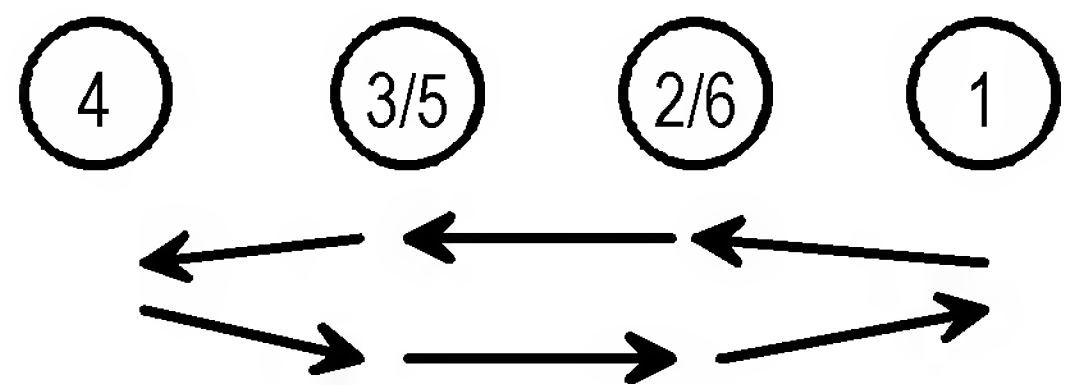## FIG. 10F   2X JUMP-1 BACKWARD
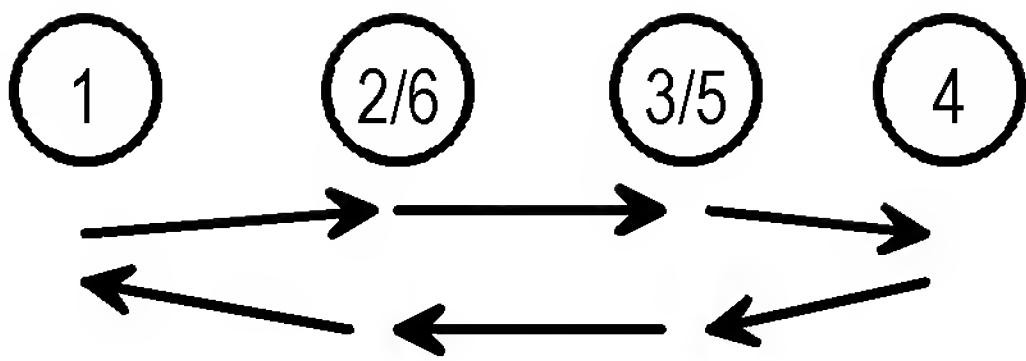
FIG. 11A
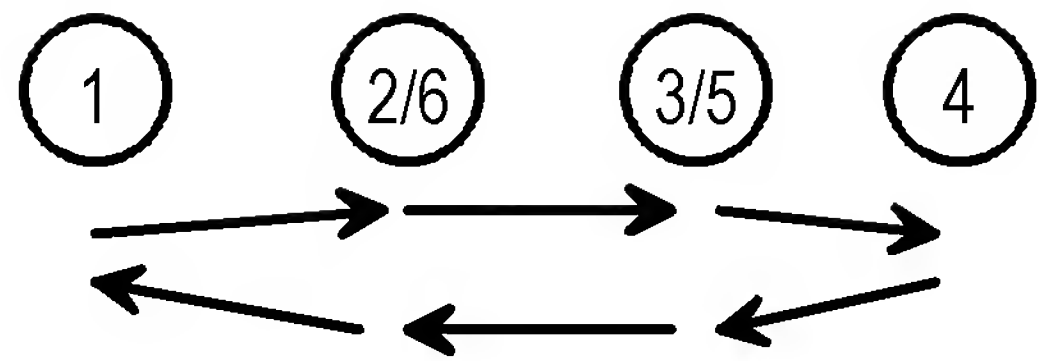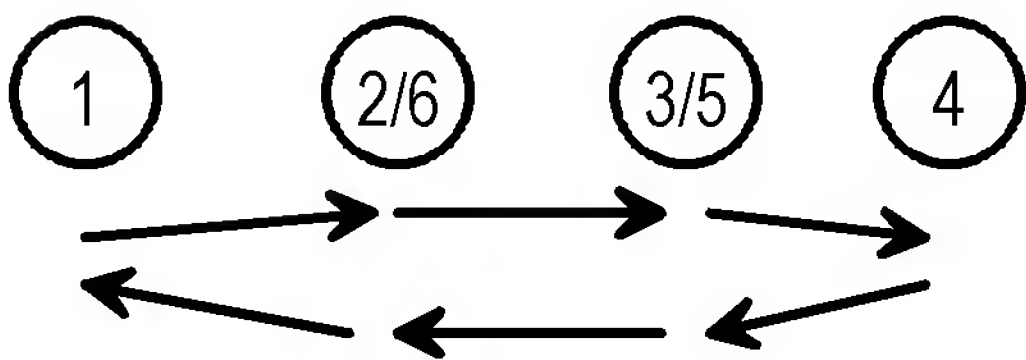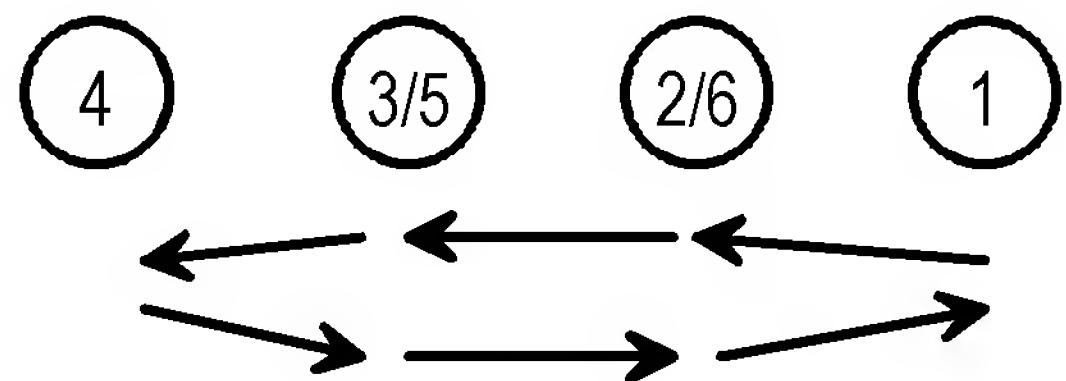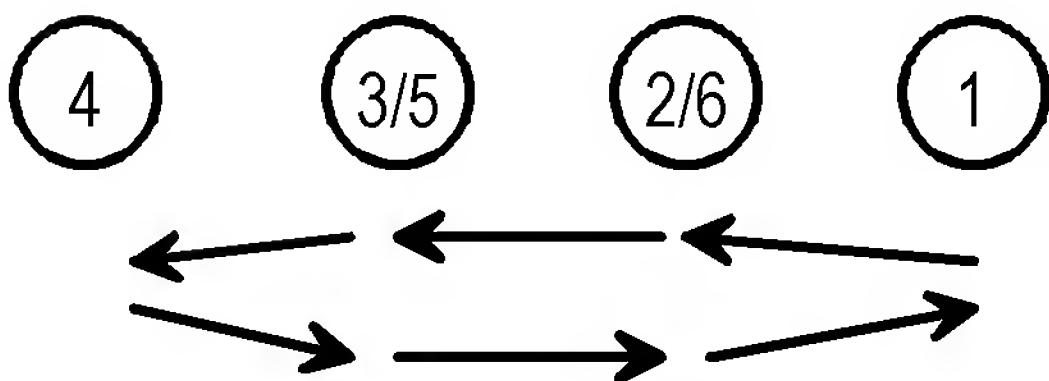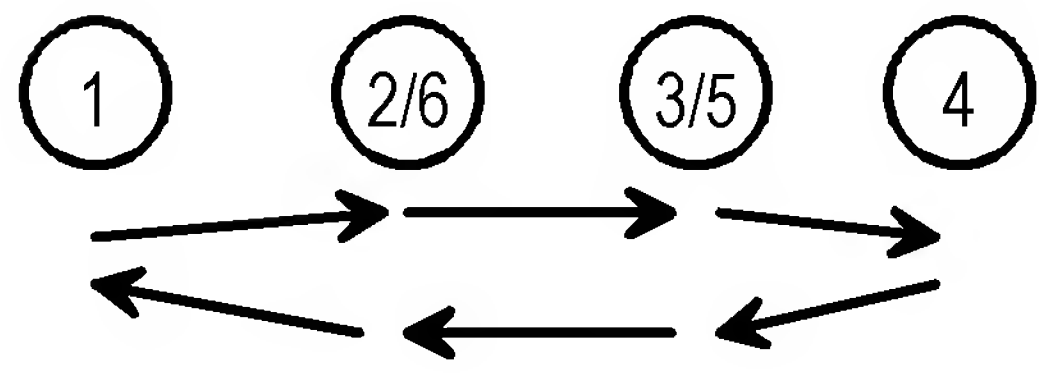
2XCLOCKWISE CIRCLES

FIG. 11B

2X COUNTER-CLOCKWISE CIRCLES

FIG. 11C

2X INWARD CIRCLES

FIG. 11D

2X OUTWARD CIRCLES